

IN THE CLAIMS

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please CANCEL claims 4, 9, 14, 19, 24 and 29, AMEND claims 1-3, 5-8, 10-13, 15-18, 20-23, 25-28, and 30 in accordance with the following:

1. (Currently Amended) A computer-implemented method of calculating a parallel efficiency of a parallel computer system in which no load imbalance exists, ~~said method comprising the steps of:~~

obtaining and storing into a storage a first information value concerning a processing time for a portion to be sequentially processed during an execution of a parallel processing program, a second information value concerning a processing time for a portion to be parallel processed during the execution of said parallel processing program, and a third information value concerning a processing time caused by an overhead for parallel processing from a result of one measurement for said parallel computer system;

calculating and storing into said storage a parallelized rate, a sequential calculation time ratio that is defined as a ratio of said first value to a value concerning a total processing time during the execution of said parallel processing program, and a parallel overhead ratio by using said first ~~information value~~, said second ~~information value~~, and said third ~~information value~~; and

calculating and storing into said storage a parallel efficiency by using said parallelized rate, said sequential calculation time ratio, and said parallel overhead ratio.

2. (Currently Amended) The computer-implemented method as set forth in claim 1, wherein

said first ~~information value~~ concerning the processing time for the portion to be sequentially processed is a number of times that sequential processing is performed, it is and is determined in a confirmation of execution status for each predetermined period during the execution of said parallel processing program, ~~that sequential processing is performed, and~~

said second ~~information value~~ concerning the processing time for the portion to be parallel processed is a number of times that parallel processing is performed, it is and is determined in the confirmation of the execution status for each predetermined period during the

execution of said parallel processing program, ~~that parallel processing is performed,~~ and
said third ~~information~~ value concerning the processing time caused by the overhead for
the parallel processing is a number of times that processing caused by the overhead for the
parallel processing is performed, ~~it is~~ and is determined in the confirmation of the execution
status for each predetermined period during the execution of said parallel processing program,
~~that processing caused by the overhead for the parallel processing is performed.~~

3. (Currently Amended) The computer-implemented method as set forth in claim 1,
wherein said first calculating ~~step~~ comprises ~~the steps of:~~

 multiplying ~~a value of~~ said second ~~information~~ value by the number of processors to
obtain a fourth information value concerning a processing time in sequential processing for the
portion to be parallel processed during the execution of said parallel processing program; and
 calculating (a value of said fourth ~~information~~ value)/(a ~~value of~~ said first ~~information~~
value + a ~~value of~~ said fourth ~~information~~ value) as said parallelized rate.

4. (Cancelled)

5. (Currently Amended) The computer-implemented method as set forth in claim 1,
wherein said first calculating ~~step~~ comprises ~~a step of dividing a value of~~ said third ~~information~~
value by a value of ~~information concerning~~ a total processing time during the execution of ~~[[for]]~~
said parallel processing program to obtain said parallel overhead ratio.

6. (Currently Amended) The computer-implemented method as set forth in claim 1,
wherein said second calculating ~~step~~ comprises ~~a step of calculating~~ $\frac{1}{\text{(said parallelized rate)} \times (1 - \text{(said sequential calculation time ratio)} - \text{(said parallel overhead ratio)})}$ as said parallel
efficiency.

7. (Currently Amended) The computer-implemented method as set forth in claim 1,
further comprising ~~a step of outputting~~ said parallelized rate, said sequential calculation time
ratio, said parallel overhead ratio, and said parallel efficiency.

8. (Currently Amended) The computer-implemented method as set forth in claim 1,
further comprising ~~a step of analyzing~~ contribution of said parallelized rate, said sequential
calculation time ratio, and parallel overhead ratio toward said parallel efficiency that is defined as

$1/(\text{said parallelized rate}) \times (1 - (\text{said sequential calculation time ratio}) - (\text{said parallel overhead ratio}))$.

9. (Cancelled)

10. (Currently Amended) A computer-implemented method of calculating a parallel efficiency of a parallel computer system in which no load imbalance exists, ~~said method comprising the steps of:~~

obtaining and storing into a storage, a first information value concerning a processing time for a portion to be sequentially processed during an execution of a parallel processing program, a second information value concerning a processing time for a portion to be parallel processed during the execution of said parallel processing program, and a third information value concerning a total processing time for said parallel processing program;

calculating and storing into said storage a parallelized rate by using the obtained first information value and the obtained second information value; and

calculating and storing into said storage a product of an inverse of said parallelized rate, an inverse of a value of said third information value, and said second information value as a parallel efficiency.

11. (Currently Amended) A computer-readable storage medium ~~program embodied on a medium, storing a program~~ for causing a computer to calculate a parallel efficiency of a parallel computer system in which no load imbalance exists, said program comprising ~~the steps of:~~

obtaining and storing into a storage a first information value concerning a processing time for a portion to be sequentially processed during an execution of a parallel processing program, a second information value concerning a processing time for a portion to be parallel processed during the execution of said parallel processing program, and a third information value concerning a processing time caused by an overhead for parallel processing from a result of one measurement for said parallel computer system;

calculating and storing into said storage a parallelized rate, a sequential calculation time ratio that is defined as a ratio of said first value to a value concerning a total processing time during the execution of said parallel processing program, and a parallel overhead ratio by using said first information value, said second information value, and said third information value; and

calculating and storing into said storage a parallel efficiency by using said parallelized rate, said sequential calculation time ratio, and said parallel overhead ratio.

12. (Currently Amended) The ~~program~~computer-readable storage medium as set forth in claim 11, wherein

said first ~~information~~value concerning the processing time for the portion to be sequentially processed is a number of times that sequential processing is performed, it is and is determined in a confirmation of execution status for each predetermined period during the execution of said parallel processing program, ~~that sequential processing is performed, and~~

said second ~~information~~value concerning the processing time for the portion to be parallel processed is a number of times that parallel processing is performed, it is and is determined in the confirmation of the execution status for each predetermined period during the execution of said parallel processing program, ~~that parallel processing is performed, and~~

said third ~~information~~value concerning the processing time caused by the overhead for the parallel processing is a number of times that processing caused by the overhead for the parallel processing is performed, it is and is determined in the confirmation of the execution status for each predetermined period during the execution of said parallel processing program, ~~that processing caused by the overhead for the parallel processing is performed.~~

13. (Currently Amended) The ~~program~~computer-readable storage medium as set forth in claim 11, wherein said first calculating ~~step~~ comprises ~~the steps of:~~

multiplying ~~a value of~~ said second ~~information~~value by the number of processors to obtain a fourth information value concerning a processing time in sequential processing for the portion to be parallel processed during the execution of said parallel processing program; and

calculating $(\text{a value of said fourth information value}) / (\text{a value of said first information value} + \text{a value of said fourth information value})$ as said parallelized rate.

14. (Cancelled)

15. (Currently Amended) The ~~program~~computer-readable storage medium as set forth in claim 11, wherein said first calculating ~~step~~ comprises ~~a step of~~ dividing ~~a value of~~ said third ~~information~~value by a value of ~~information~~ concerning a total processing time during the execution of ~~[[for]]~~ said parallel processing program to obtain said parallel overhead ratio.

16. (Currently Amended) The ~~method~~computer-readable storage medium as set forth in claim 11, wherein said second calculating ~~step~~ comprises ~~a step of~~ calculating $1 / ((1 / (\text{said$

parallelized rate) x (1-(said sequential calculation time ratio)-(said parallel overhead ratio)) as said parallel efficiency.

17. (Currently Amended) The ~~program~~computer-readable storage medium as set forth in claim 11, said program further comprising ~~a step of outputting~~ said parallelized rate, said sequential calculation time ratio, said parallel overhead ratio, and said parallel efficiency.

18. (Currently Amended) The ~~program~~computer-readable storage medium as set forth in claim 11, said program further comprising ~~a step of analyzing~~ contribution of said parallelized rate, said sequential calculation time ratio, and parallel overhead ratio toward said parallel efficiency that is defined as $1/(\text{said parallelized rate}) \times (1 - (\text{said sequential calculation time ratio}) - (\text{said parallel overhead ratio}))$.

19. (Cancelled)

20. (Currently Amended) A ~~program embodied on a medium~~computer-readable storage medium storing a program for causing a computer to calculate a parallel efficiency of a parallel computer system in which no load imbalance exists, said program comprising ~~the steps of~~:

obtaining and storing into a storage a first informationvalue concerning a processing time for a portion to be sequentially processed during an execution of a parallel processing program, a second informationvalue concerning a processing time for a portion to be parallel processed during the execution of said parallel processing program, and a third informationvalue concerning a total processing time for said parallel processing program;

calculating and storing into said storage a parallelized rate by using the obtained first informationvalue and the obtained second informationvalue; and

calculating and storing into said storage a product of an inverse of said parallelized rate, an inverse of a value of said third informationvalue, and said second informationvalue as a parallel efficiency.

21. (Currently Amended) An apparatus for calculating a parallel efficiency of a parallel computer system in which no load imbalance exists, comprising:

means for obtaining and storing into a storage a first informationvalue concerning a processing time for a portion to be sequentially processed during an execution of a parallel processing program, a second informationvalue concerning a processing time for a portion to be

parallel processed during the execution of said parallel processing program, and a third informationvalue concerning a processing time caused by an overhead for parallel processing from a result of one measurement for said parallel computer system;

a first calculator for calculating and storing into said storage a parallelized rate, a sequential calculation time ratio that is defined as a ratio of said first value to a value concerning a total processing time during the execution of said parallel processing program, and a parallel overhead ratio by using said first informationvalue, said second informationvalue, and said third informationvalue; and

a second calculator for calculating and storing into said storage a parallel efficiency by using said parallelized rate, said sequential calculation time ratio, and said parallel overhead ratio.

22. (Currently Amended) The apparatus as set forth in claim 21, wherein

said first informationvalue concerning the processing time for the portion to be sequentially processed is a number of times that sequential processing is performed, it is and is determined in a confirmation of execution status for each predetermined period during the execution of said parallel processing program, ~~that sequential processing is performed, and~~

said second informationvalue concerning the processing time for the portion to be parallel processed is a number of times that parallel processing is performed, it is and is determined in the confirmation of the execution status for each predetermined period during the execution of said parallel processing program, ~~that parallel processing is performed, and~~

said third informationvalue concerning the processing time caused by the overhead for the parallel processing is a number of times that processing caused by the overhead for the parallel processing is performed, it is and is determined in the confirmation of the execution status for each predetermined period during the execution of said parallel processing program, ~~that processing caused by the overhead for the parallel processing is performed.~~

23. (Currently Amended) The apparatus as set forth in claim 21, wherein said first calculator comprises:

a multiplier for multiplying ~~a value of said second informationvalue~~ by the number of processors to obtain a fourth informationvalue concerning a processing time in sequential processing for the portion to be parallel processed during the execution of said parallel processing program; and

a calculator for calculating (a value of said fourth informationvalue)/(a value of said first

~~informationvalue~~ + ~~a value of said fourth informationvalue~~) as said parallelized rate.

24. (Cancelled)

25. (Currently Amended) The apparatus as set forth in claim 21, wherein said first calculator comprises a divider for dividing ~~a value of said third informationvalue~~ by a value of ~~information~~ concerning a total processing time during the execution of ~~[[for]]~~ said parallel processing program to obtain said parallel overhead ratio.

26. (Currently Amended) The apparatus as set forth in claim 21, wherein said second calculator comprises a calculator for calculating $[[(((1/(\text{said parallelized rate}) \times (1 - (\text{said sequential calculation time ratio}) - (\text{said parallel overhead ratio}))$ as said parallel efficiency.

27. (Currently Amended) The apparatus as set forth in claim 21, further comprising an output device for outputting said parallelized rate, said sequential calculation time ratio, said parallel overhead ratio, and said parallel efficiency.

28. (Currently Amended) The apparatus as set forth in claim 21, further comprising an analyzer for analyzing contribution of said parallelized rate, said sequential calculation time ratio, and parallel overhead ratio toward said parallel efficiency that is defined as $1/(\text{said parallelized rate}) \times (1 - (\text{said sequential calculation time ratio}) - (\text{said parallel overhead ratio}))$.

29. (Cancelled)

30. (Currently Amended) An apparatus for calculating a parallel efficiency of a parallel computer system, comprising:

means for obtaining and storing into a storage a first ~~informationvalue~~ concerning a processing time for a portion to be sequentially processed during an execution of a parallel processing program, a second informationvalue concerning a processing time for a portion to be parallel processed during the execution of said parallel processing program, and a third informationvalue concerning total processing time for said parallel processing program;

a first calculator for calculating and storing into said storage a parallelized rate by using the obtained first ~~informationvalue~~ and the obtained second ~~informationvalue~~; and

a second calculator for calculating and storing into said storage a product of an inverse

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of said parallelized rate, an inverse of a value of said third informationvalue, and said second informationvalue as a parallel efficiency.